Coastal and floodplain grazing marsh

Introduction

Grazing marsh is periodically inundated pasture, or meadow with ditches to maintain the water levels containing standing brackish or fresh water. These ditches are especially rich in plants and invertebrates.

Almost all high-quality areas are grazed, but some are cut for hay or silage. Sites may contain seasonal water-filled hollows and permanent ponds with emergent swamp communities, but not extensive areas of tall fen species like reeds.

Much of the UK's grazing marsh has been lost in the past century, particularly in the Greater Thames area, especially via conversion of fields to cereal production, entailing over-deepening of ditches and inevitable eutrophication from fertiliser run-off. Only a small proportion of the remaining grassland is unimproved, supporting a high diversity of native plant species.

Grazing marsh main drain - Cliffe © Roger Key

Threats

- **Drainage**

Drainage of marshes for agriculture

- **Development**

Many grazing marshes have been lost to development (particularly in the Greater Thames area)

- **Decline in traditional management**

Most notably removal of stock grazing needed to maintain poaching at the edge of ditches

- **Nutrient enrichment**

Eutrophication of ditches from agricultural run-off

- **Pollution**

Contamination of ground- or surface water by industry or sewage

- **Climate change**

Sea level rise and coastal squeeze

Habitat management

Maintain habitat diversity

Maintenance of a varied vegetational structure and a rich mosaic of habitats from bare ground to patchy scrub is very important to provide a broad range of niches for invertebrates. Features such as permanently damp hollows and temporary pools may be of considerable importance and should be retained.

Maintaining a rich mosaic of habitats and high salinity levels in at least some areas is of primary importance for scarce and specialist invertebrates associated with this complex habitat type. Most rare species are found at the transition between brackish and freshwater conditions, whilst some specialise in truly brackish situations. Relatively few purely freshwater rarities are confined to levels, the Ornate Brigadier Soldierfly (*Odontomyia ornata*) and the Four-lined Horsefly (*Atylotus rusticus*) being among the exceptions.

Field surface grassland, vegetated banks, semi-natural ditches and artificial ditches with gentle sides are all of importance, and all of these may be exploited by invertebrates, according to season and habitat condition. Early succession habitat, both with strong saline influence and without, is a requirement for many species.

The continuity of such habitat is best ensured by managed saline incursion and flooding, coupled with the maintenance and/or creation of pools and ditches with gently sloping sides.

Maintain light grazing

Ground beetle *Badister unipustulatus* Crowland, Lincs (c) Roger Key

Low level grazing to maintain plant diversity and open conditions is recommended. Cattle tend to produce a more varied tussocky structure than sheep and also create microhabitats for invertebrates through trampling.

Overgrazing, especially by sheep, can eliminate *Deschampsia* tussocks, which provide shelter for many invertebrates.

A varied vegetational structure is best achieved by grazing during the summer months as it is often too wet for stock to be on site in the winter. Many grassland sites are also important for breeding waders and so the stocking density can be relatively low in the spring and early summer with an increase in numbers from July.

Cattle can be kept on site into the autumn and even into the winter if its dry enough and the habitat mosaic and overwintering structure for invertebrates is not compromised. This will vary from site to site and depend on the number of grazing animals.

Grazing later in the season will benefit species such as acalyptrate flies, whose larvae live in the developing seeds of grasses. Allowing plants to flower will provide pollen and nectar for adult insects.

The presence of grazing livestock on a site also provides a supply of dung, which is important for species such as the Maid of Kent Beetle (*Emus hirtus*) , the rove beetle *Oxytelus piceus* and the dung beetle *Aphodius consputus* as well as many fly larvae. Dosing of livestock with broad-spectrum de-wormers is damaging to insect development and alternative treatments should be used wherever possible. Dosing the cattle off-site and keeping them off land of conservation value for at least 10 days after treatment will reduce the impact of worming treatments on the invertebrate dung fauna.

Manage drainage ditches

In general, the interest of coastal and floodplain grazing marsh lies in the associated water-bodies, not the grassland. Thus the high invertebrate values are generally confined to the ditches, which act as linear ponds for aquatic and water margin faunas. This habitat is very important for brackish invertebrate faunas, as well as freshwater ones. Over-management of ditches, including over-deepening, has impoverished many areas of levels habitat, so getting the management formula right is critical.

Drainage ditches require management, otherwise they silt up and become choked with vegetation. However, all stages in this process of siltation will support interesting invertebrate communities, so it is important to have a good rotational management plan to ensure that there is continuity of habitat at all stages. In particular, the high value for invertebrates of ditches that have reached a late successional stage and become choked should be recognised. Within an area of levels, all ecological options should be present and it is vital to ensure that there is a good source for natural re-colonisation of managed ditches.

Ensure that water levels in ditches and associated waterways are reasonably high (close to field level) throughout the year. This may drop in summer through natural evaporation or lack of rainfall, especially in eastern areas. Fluctuating water levels need not be detrimental to the invertebrates present, as long as the change is not too rapid and the ditch is not too steep sided. If a ditch is so deep or steep that cattle cannot get down to drink or graze on water edge vegetation, or cannot get out again, then a cattle trampled berm will not be created or maintained.

Extended winter flooding may have an adverse effect on terrestrial invertebrates such as weevils, but its effects on aquatic species are not known.

Great silver water beetle (*Hydrophilus piceus*) (c) Roger Key

Encourage diverse marginal vegetation

Mild poaching by cattle at ditch margins is beneficial to many of the invertebrates found in this habitat, as poaching produces patches of bare mud or peat and provides uneven surfaces with mini-pools. Critically, cattle trampling results in the formation of a berm at about summer water level, and it is this feature that supports many of the specialised water-transition invertebrates (sheep are not heavy enough to create a berm). Providing stock levels are not excessive, taller water margin plants should flourish along plenty of the ditch margins. Fencing to exclude cattle from ditch margins prevents this and should not be widely adopted across a whole site. Wherever possible, such fencing should be removed, although some areas of denser marginal vegetation along fenced stretches will be beneficial to invertebrates such as spiders. The Scarce Emerald Damselfly (*Lestes dryas*) is also dependent on dense vegetation in shallow water throughout its life cycle, so at sites where this is present, grazing should be controlled and minimised.

Adopt rotational ditch cleaning

Clearing all ditches at the same time is to be avoided and a rotational ditch management plan should be adopted. Good practice in ditch management allows ditches to be stagger cleared so that only short sections are cleared in any one year, allowing cleared areas to be re-colonised from adjacent uncleared sections. Another option is to clear only one side of a ditch at a time.

As many invertebrates such as molluscs have limited mobility, it is important to ensure that patchiness is maintained across the site and that adjacent ditches are not cleared in the same year. Management should aim to achieve a patchwork of ditches at different successional stages with a long cleaning cycle of 5 years or more wherever possible. Some stretches of ditches that are completely choked with vegetation should be allowed to remain on a site.

The Norfolk hawker dragonfly (*Aeshna isosceles*), for example, requires dykes or ditches with abundant Water soldier (*Stratiotes aloides*). Any dredging carried out should be carefully planned to facilitate natural colonisation by the plant and insect from neighbouring dykes or dyke sections.

In the past, traditional management relied on manual labour as stretches were cleared of plants and dredged by hand. This management technique causes less disruption leaving plants and larvae behind, but nowadays almost all ditch cleaning is done by machine. Care therefore needs to be taken that the process is not too destructive. Roding, if necessary, should be carried out in winter and vegetation left on banks until it dries out before being removed, to enable the invertebrates in the material to return to the ditch. Take care not to smother the marginal vegetation in this process, however.

Create varied ditch profiles

Ditch profiles (both across and along the ditch) should be sculpted to provide diverse habitat conditions at all water levels. Installing berms (a shelf at about water level) can add to the variety of conditions within a ditch. Hard-edged ditches with vertical sides support very few invertebrate species, although if the ditch sides provide loose, damp soil they may be good for some ground beetles. In general, reducing the angle of slope from 45° to 35° or less will greatly benefit many wetland invertebrates and allowing cattle access to ditch margins will soften the bank profile and provide muddy margins.

It is important to recognise that meandering ditches may be the courses of saltmarsh creeks before enclosure as farmland. If they have never been dug out, the profile of the ditch may be a shallow U-shape with gently sloping sides which are ideal for many invertebrates.

Maintain water quality

Nutrient enrichment of the water in ditches is likely to lead to growth of algal mats that will smother the surfaces of sediments, faster choking of ditches with vegetation and a loss of botanical interest. These factors are all likely to have an adverse effect on the invertebrate fauna. Management should aim to reduce nutrient input wherever possible in the vicinity of this habitat type. Any supplementary feeding of livestock should be done away from the site and the grassland should not be improved by adding fertilisers.

Pesticide residues in water can also be very damaging to invertebrate communities. Disposal of sheep dip in water courses or by spraying onto agricultural land kills large numbers of invertebrates; the loss of a colony of the Southern Damselfly (*Coenagrion mercuriale*) in Wales has been attributed to the dumping of sheep dip.

Maintain brackish ditches and waterbodies

In coastal areas drains and ditches are often brackish due to seepage or leaking sluices. There are a number of specialist species associated with brackish water that would disappear if control structures were repaired or renewed to prevent salt water entering ditch systems. In order to retain a good brackish water invertebrate community, it is important to maintain a stable salinity. Small changes due to rainfall are tolerated, but flushing freshwater through a brackish ditch could have devastating consequences on the fauna and should be avoided.

Prevent scrub and carr invasion

Ideally, levels and grazing marshes are open landscapes. The occasional bush or tree may act as assemblage points for mating soldierflies, for example. A hedge sited away from a ditch may provide shelter for adult dragonflies as well as hibernation sites and flowers for insects to visit, and isolated willows may be the preferred situation of the Cream-bordered Green Pea Moth (*Earias clorana*). However, shaded ditches can only support a very limited invertebrate fauna so the priority is to allow full sunlight.

Scrub should be managed on a regular basis and dense thickets should not be allowed to develop on grazing marsh habitat although a scattering of scrub is beneficial. Succession to carr woodland should also be prevented.

BAP species associated with coastal and floodplain grazing marsh:

Lesser Water Measurer (*Hydrometra gracilenta*)
Crucifix Ground Beetle (*Panagaeus cruxmajor*)
a ground beetle *Badister collaris*
Saltmarsh Shortspur Beetle (*Anisodactylus poeciloides)*
Lesser Silver Water Beetle (*Hydrochara caraboides*)
Great Silver Water Beetle (*Hydrophilus piceus*) (proposed)
Brown-banded Carder Bee (*Bombus humilis*)
Mole Cricket (*Gryllotalpa gryllotalpa*) (The presence of mole crickets on suitable habitat cannot be ruled out)

For a more comprehensive list of species associated with this habitat, please see the download list.

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